

MULTIBAND ANTENNA

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OBJECT AND BACKGROUND OF THE INVENTION

- 5 The present invention relates generally to a new family of antennas with a multiband behaviour. The general configuration of the antenna consists of a multilevel structure which provides the multiband behaviour. A description on Multilevel Antennas can be found in Patent Publication No. WO01/22528. In the present invention, a modification of said multilevel structure is introduced such
- 10 that the frequency bands of the antenna can be tuned simultaneously to the main existing wireless services. In particular, the modification consists of shaping at least one of the gaps between some of the polygons in the form of a non-straight curve.
- 15 Several configurations for the shape of said non-straight curve are allowed within the scope of the present invention. Meander lines, random curves or space-filling curves, to name some particular cases, provide effective means for conforming the antenna behaviour. A thorough description of Space-Filling curves and antennas is disclosed in patent "*Space-Filling Miniature Antennas*"
- 20 (Patent Publication No. WO01/54225).

- Although patent publications WO01/22528 and WO01/54225 disclose some general configurations for multiband and miniature antennas, an improvement in terms of size, bandwidth and efficiency is obtained in some applications when
- 25 said multilevel antennas are set according to the present invention. Such an improvement is achieved mainly due to the combination of the multilevel structure in conjunction of the shaping of the gap between at least a couple of polygons on the multilevel structure. In some embodiments, the antenna is loaded with some capacitive elements to finely tune the antenna frequency
- 30 response.

In some particular embodiments of the present invention, the antenna is tuned to operate simultaneously at five bands, those bands being for instance